

Hacking Tips - For Gamesters
 From the National Software Library
 (more inside)

IN THIS ISSUE

JET SET WILLY,
 POKE 50552,170: POKE 50553,170 Blocks Hades
 POKE 37982,0 : POKE 37994,0 Walk thro' monsters
 POKE 60231,0 Improve Conservatory
 POKE 36545,0: POKE 56876,4 Banyan Tree easier
 POKE 57411,160: POKE 57362,26: POKE 57464,170
 Safer in Priest's Hole
 POKE 50512,168: POKE 50520,168: POKE 50528,170
 Ledge in Security Guard
 POKE 54814,0 Removes star from main stairway
 POKE 37925,0 You can go straight to bed
 POKE 64610,21: POKE 64632,85: POKE 64633,85:
 POKE 64634: POKE 64635,4: POKE 49386,60:
 POKE 49263,0: POKE 49271,0
 Travel between THE BOB & THE OFF LICENCE
 POKE 56350,0: POKE 56358,0 Adds a platform to
 first landing
 POKE 41983,255 When you collect the tap, you can
 see the final effect.
 POKE 36635,239 You can use Interface 2
 POKE 38240,0 This obliterates Martha
 POKE 59900,0 Disables the Attic bug

THE LAST POKE

At last, I've done it! I've found
 a POKE to get rid of Jet Set
 Willy!! It's: POKE JET SET
 WILLY, BIN. And it works.
 Mal Goodman
 Leeds

YOUR SPECTRUM

List

ELECTIONS

Nominations for Officers for 1986 should be made at the
 November meeting. The following positions need filling.

President	Correspondence Sec'y
Sec'y Treas.	Newsletter Editor
Tape Library Coordinator	Data Base/Library Manager
Hardware Group Leader	

These individuals comprise the executive committee. If
 you feel you could serve in one of these capacities,
 please have your name placed in nomination. In addition,
 several of the positions require assistants (e.g., News-
 letter, Database), if you feel you could serve in one of
 the work groups please tell Jeff S. or Paul D.

SUBJECT

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SUBSCRIPTION NOTICE

Please check your mailing label. Above your last name you
 will see the month and year in which you will receive your
 last issue of LISTING (LLIST) Newsletter. If this number
 does not agree with your records please let us know. This
 is a good time too, to request information on specific
 subjects for next years newsletters or just let us know
 what your special needs are.

MEETING NOTES - SUNDAY SEPTEMBER 8TH, 1985

The meeting was called to order at 2:30PM. Paul D. reported that current paid-up membership is now 110. The treasury is in good shape and should continue that way if our current newsletter printer can hold the line on prices (5¢ per page). Attendance at the meeting, held in Christ Lutheran Church in Northport, was light, with only 15 members in attendance.

The business portion of the meeting centered around getting the hardware group started. After much debate (and a coin toss), it was decided to make the October meeting a special hardware session. After the business meeting, there will be a short familiarization and introduction to soldering techniques, followed by the step by step construction of the Oliger Boards. While some tools may be available at the meeting, those wishing to participate are requested to bring solder (resin core - get the small tube at Radio Shack), their Oliger Boards (if they have already obtained them), and the tools shown below. A lighted magnifying glass is also highly desirable. Other members wishing to learn more about hardware construction techniques are encouraged to attend, as observers.

Paul D. noted that some members have still not returned library material. The remaining material has been placed in several large packets for lending. This reduces the number of people who can access material at one time, but allows us to track the materials more accurately. Marin H., Bob G., Tom S., and Harvey R. borrowed materials at this meeting.

Library tapes are not being returned as quickly as was hoped. Tape #4 is 75% complete and should be ready by October 1st. Members who have not returned the 3.5 tape by then will not receive #4 until the "fast track" members have returned their #4. This cuts costs (we'll only make 1/2 as many tapes) and should suit both the fast and slow return members. Remember, if you don't have time to review the programs, simply make a tape-to-tape copy. Use the Radio Shack attenuator or Winky board with two decks, buy a dubbing deck or have the tape duplicated commercially (about \$5.00). The faster you turn the tape around, the earlier you'll receive the next one. New loops will be assigned based on your turn-around time.

No one had thought to bring a "system" with them. Chuck R. slipped home and bought in his 2068 though, so that demos could be made. It will be particularly important for the hardware meeting for those attending to have a 2068 with them. Then we can be 100% sure that your board works on your machine.

Martin H. showed us an arresting graphics demo program from Syncware News. He also intended to show us his prototype "Talking Eliza" program, using the Zebra-talker. However, the power to the area was disrupted by a heavy thunderstorm which made it impossible to run the demo for most of the meeting. The meeting did continue without any real hitches, even without power.

Cedric B. showed us some excellent photographs of his ZX82 and 2086 computers and described his requirements for the "perfect" keyboard and system. Cedric noted that he feels the only really reliable system has all boards and peripherals "bolted down". Bob G. stated that, for his needs, the flexible ribbon route was more suitable. The pros and cons of both methods of system expansion were debated.

The Blast compiler was discussed. This program will compile Spectrum programs written in BASIC. It does an outstanding job when used with microdrives, but users comment that it is much too cumbersome and difficult to understand when using tape as the storage medium.

Bob G. discussed his AERCO and TC 2068 disk drive system. He showed us a special 34 pin "twistor" he had used to extend his drives. Bob is running 5 1/4" drives from the TC 2068 (Timex Portugal) drive controller. He says the \$40 REMEX drives work fine. Bob did lose his TC power supply - just not up to the task (even with just the supplied drive). He replaced it with an ASTEC switching P.S., from M.C. Howard, and is quite happy with the results. He also recommends the \$125 AMDISK 3.

Since Bob has both the AERCO and TIMEX systems, he was asked for his comments on each. He feels the TOS (Timex operating system) is technically superior to AERCO's, at this time, but that AERCO's DOS is faster. Support seems good for both systems, though AERCO may have the edge on OEM questions. They send upgrade EPROMs to owners for a nominal fee, and are "local". Bob says AERCO's board should be expandable, memory-wise, by simple chip replacement.

Jeff Street showed us his 64 column operating system in a 16K EPROM on an Oliger Board. He has rewritten Timex's operating system to use "true" 64 column mode and even includes plot and draw. We didn't have an RGB monitor so we couldn't see it in all its glory - can somebody bring one next time?

Where is the Zebra BBS?

Marty J. will be going to Portugal this winter. See him if you have any special request.

Bob G. has connected 3 Oliger back planes to his 2068 in order to get all his peripherals in use at one time.

Martin H. and Miles C. will be assisting Jeff S. in the creation of the User Group Newsletter Database. This will catalog the articles in back issues of all the exchange newsletters we receive. It is anticipated that the task will begin in October and take several months to complete. Anyone wishing to help in this endeavor should contact Jeff.

NEXT MEETINGS

October 6th at 2:00PM at John Gaddis house in Sayville.

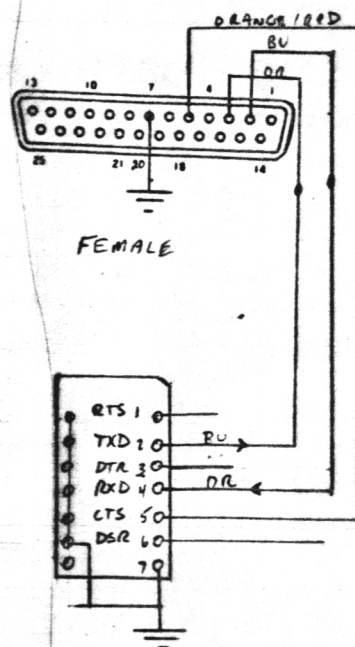
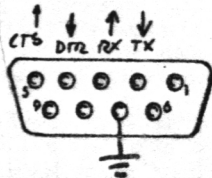
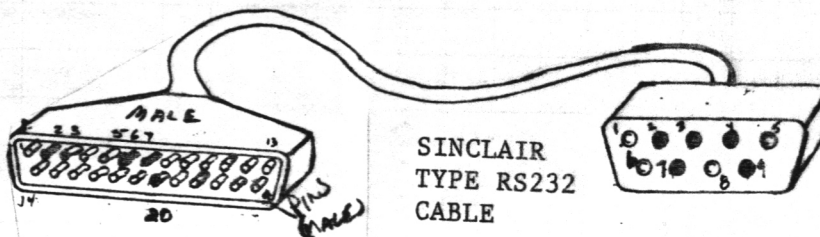
November 3rd - 2:00PM - Huntington Public Library - (Tentative)

LIST

* ON PAGE 20

Group

There should be a lot of things to do with these routines. They could be used in some sort of integration software to create your own BB, or maybe even a terminal program in BASIC. Good Luck!

Subject BYTE BACK TO IF 'I' INTERFACE
RS232INSTALL DB-25'
CONNECTOR
ON MODEM CASEBYTE-BACK
MD-2
BACK SIDEFEMALE DB-9
ON IF ONECONNECTED?
20?SOFTWARE - TS1000 OUTPUTS DATA
ZX SPECTRUM RECEIVETS1000 W/BYBACK
USE ASC II BASIC
PROGRAM SUPPLIED
BY BYTE BACKZX SPECTRUM (IF ONE)
USE SOFTWARE IN
IF ONE MANUAL
(E.G., OPEN #4 ETC.)

25-D PIN #	GOES TO	9-D PIN #	
2	SD (TD)	RX	3
3	RD	TX	2
5	CTS	←	5 OUTPUT 1=ON
6	DR	←	9 (9V) 4=ON
7	GROUND	7	
20	ER	→ RS 4	DTR - HIGH WHEN READY

300 BAUD
7 bit
NO PARITY
1 STOP BIT

2
8
0
64
74

 - 78 FOR 8 BIT

MISCELLANEOUS MAGNETIC TAPE TIDBITS

By Cedric R. Bastiaans

Page A

In this, Part III of this series, we will chat a little more about cassette decks and tapes.

First, let's list the performance features, which are required or desirable in our choice of decks for data storage and retrieval.

1.0 POWER SUPPLY

1.1 SIX VOLT DC should be the minimum supply for which the deck is designed to operate. Anything less than this will undoubtedly give you LOADING problems, because of inadequate output voltage levels.

1.2 BATTERY OPERATION is preferable over AC operation with an adapter. Hum problems will then be basically non-existent.

Caution: Do NOT use NiCad (nickel cadmium) batteries, as these have too low a voltage potential. Nominally 1.2 V, whereas the standard cells (zinc-manganese or alkaline) put out 1.55 V. Thusly, four standard cells in series supply 6.2 V when new, while NiCad's would only put out 4.8 V !

2.0 TAPE COUNTER

A very useful feature; it helps in locating already recorded programs, thusly it could prevent their accidental erasure.

Wouldn't it be wonderful if all tape counters would operate alike and everyone could use one and the same, interchangeable system of marking beginning and end of a recorded program? Alas, this is not so.

3.0 AC BIAS

Stay away from decks that use DC bias for recording. The noise and distortion associated with this kind of inexpensive biasing is unacceptable for data recording (or even for speech, as far as I'm concerned).

High frequency AC bias is a must.

4.0 AC ERASE

It is unlikely that you will find an inexpensive tape deck with this feature. But if you do, buy it! The tape noise caused by DC erasure (most of our little decks are outfitted with this erase system), is typically 5 dB worse than that left by AC erasure. This is just a desirable feature; life without it is quite tolerable!

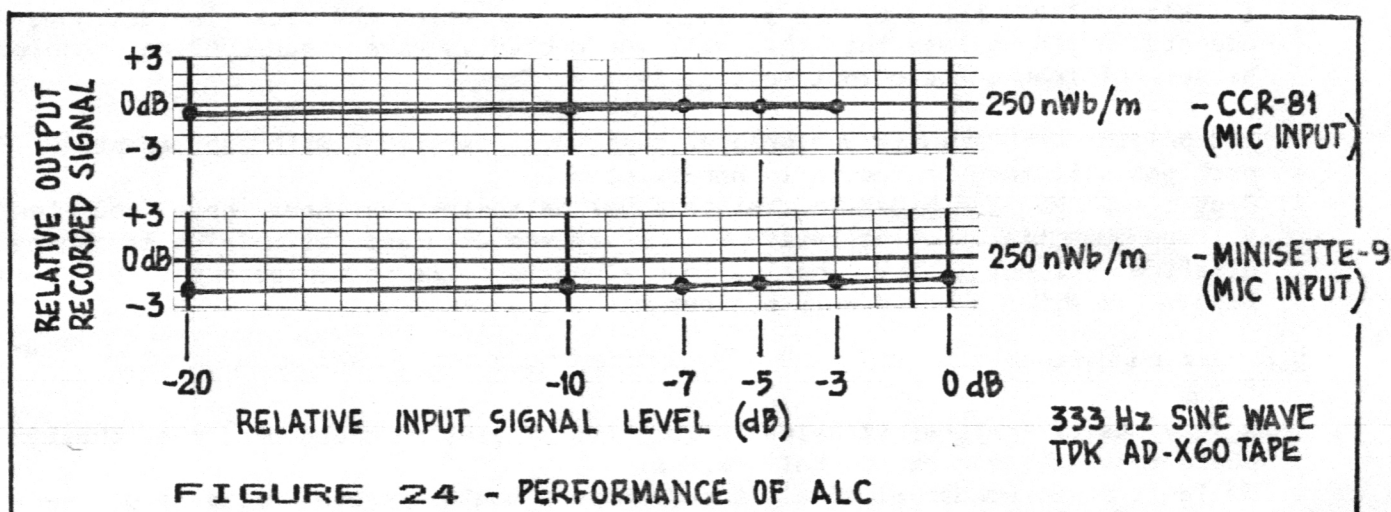
5.0 AUTOMATIC LEVEL CONTROL

This feature, abbreviated ALC, is also known as Automatic Gain Control or AGC and Automatic Volume Control or AVC. Its purpose is to keep the recorded signal level practically constant for a wide range of input levels. It has been suggested that ALC, AGC or AVC is a possible cause for incorrectly recorded levels of commercial cassette software, because these circuits have been designed for SPEECH and not for DATA BITS. I disagree with these suggestions; my VU meter tests (see part I) show that there is a GREAT similarity between speech signals and the Sinclair data waveforms as far as their effective levels are concerned. Of course, if the circuits, unbeknownst to the operator of the deck, don't work properly, one is left with a false sense of security that levels will be correct.

The ALC's of both my Radio Shack CCR-81 and Minisette-9 work perfectly (knock on wood), witness for instance the levels of tape #21 of Figure 7 in part I and tape #9 in the Table.

Figure 24 shows the levels of 333 Hz sinewave signals, recorded on these decks, as a function of varying input levels. The input ranges of 17 dB and 20 dB for respectively the CCR-81 and the Minisette-9 are the result of the limitations in the measuring setup and are NOT the result of any limitation in the ALC circuitry.

This performance is very good indeed and certainly more than adequate for our purpose, since it means that the recorded level is kept practically constant, even with an input level that may vary by a factor of 7 or 10!



6.0 FREQUENCY RESPONSE (FR)

It is undesirable to have a very wide, High Fidelity FR. It would only cause trouble with hum and (RAM)noise. Actually, a response of 200 to 8000 Hz is what I would call ideal for our work.

Now, in part I you saw what looked like a superior pulse performance by the Minisette-9 (M-9). I will have to elaborate a little on this.

A rule of thumb is, that for near-perfect pulse or square-wave recording and reproduction, the FR should extend to 10 times the fundamental signal frequency. It can NOT be expected that the M-9 would have a bandwidth of 20 kHz, so as to cope with a 2040 Hz pulse! What CAN be expected is that in this tape deck, the playback signal gets amplitude limited in the output stages (overload), thus creating sharp output pulses!

More about this in Part IV, when I will discuss test tapes. For now, I'm only showing you Figure 25, the FR of the CCR-81.

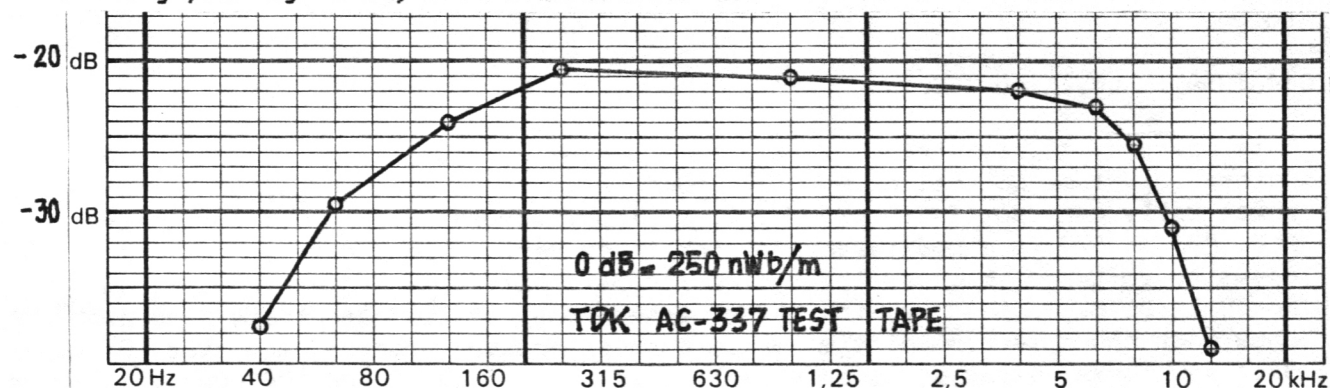


FIGURE 25 - PLAYBACK RESPONSE OF CCR-81

Next, I will discuss various points of interest, which can be grouped together under the heading:

7.0 GOOD OPERATING PRACTICE

7.1 TONE CONTROL - It is unlikely that you would find an elaborate set of tone controls on your simple deck. Chances are that it will just roll-off the high frequencies. You should always set it at "high" or "H" or "10" or whatever the indication is of the position when the control is effectively out of the circuit.

Better yet, experiment with the settings, to get the most reliable LOAD. Don't bother with intermediate settings; it's either all the way in or all the way out...

7.2 CONTAMINATION - I devoted an entire chapter on the dangers of contamination and abuse. Of course, all that I wrote about cassettes, holds true for diskettes (floppies) as well. It's quite alright to be sort of "paranoid" about contamination! I am.

Figure 26 shows the relative sizes of sources of contamination. I couldn't very well depict the size of a smoke particle of a mere 25 microinch diameter (see paragraph b. on page D of Part II, as a reminder what this can do to the signal level), so I drew one that is 10 times larger. Compare that with the finger print, dust and hair! Frightening, what?

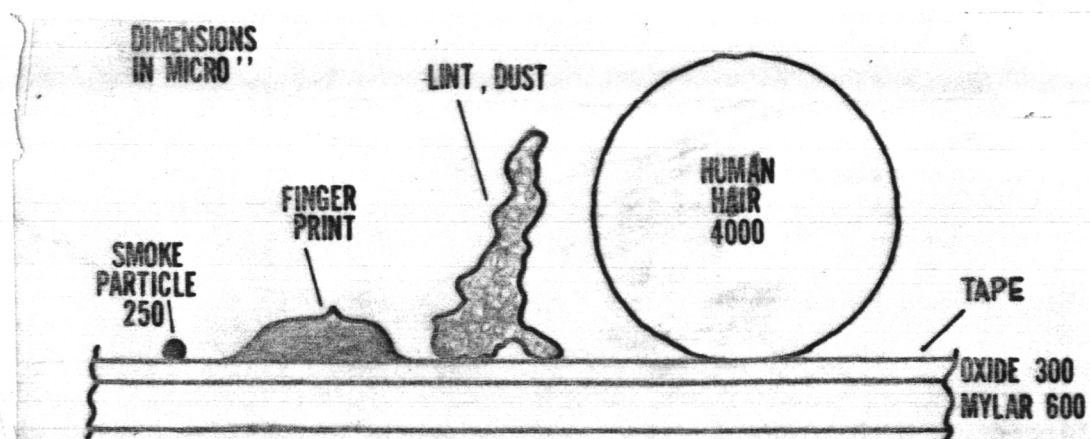


FIGURE 26

7.3 CLEAN HEADS AND CAPSTAN - You should use a good head and capstan cleaner, to regularly remove any magnetic oxide deposits. Do NOT use any kind of solvent for this! Denatured alcohol or a Freon cleaner is fine.

Don't forget to clean the erase head too!

To clean the capstan, run the deck in "PLAY" (without a cassette in place) with the "PAUSE" button depressed. The capstan will be rotating, but the rubber roller is disengaged.

The roller can be cleaned with the "PAUSE" button released, so that it is rotating, but be careful that it doesn't catch the cleaning swab.

You might want to try one of the cleaning cassettes on the market. They come with a small quantity of cleaning agent.

7.4 DEMAGNETIZE HEADS - In the course of time, the record/play head will become somewhat magnetized. The cause are signal and RF bias switch-off transients.

Magnetized heads cause two kinds of problems: high frequency erasure and the most annoying one, tape noise.

There are good head demagnetizers on the market, but choose one with plastic coated tips. Bare metal tips may scratch the heads!

My personal preference goes to TDK's ELECTRONIC head demagnetizing CASSETTE. It is lately available under private brandnames. It very effectively demagnetizes the signal head in ONE SECOND. A word of CAUTION though: For it to operate, the signal head has to be put in its operating (PLAY) position. Most of our little tape decks then also engage the playback electronics. Since the electronic demagnetizer puts out a hefty AC signal (650 Hz at 220 gauss) severe overload of the player's circuits may result. My advice is, to REMOVE the deck's batteries altogether and take no chances. Turning down the volume control does NOT protect the first few stages of the playback electronics. The inconvenience is slight and it is worth the trouble; this electronic head demagnetizer does a better job than you can do manually!

Tape noise and high frequency amplitudes may improve as much as 10 dB!

7.5 MAGNETIC INTERFERENCE - Another thing you should be "paranoid" about is the way magnetic fields around us affect the tape cassettes and floppies. Dependent on the field strength, such fields may mutilate or completely erase recorded data.

Please realize how much magnetism is around us! Transformers, relays, motors, loudspeakers, headphones... And we are surrounded by items that contain such components. Monitors, TV's, printers, power supplies and more, like telephones, radios, HiFi sets, electric fans.

It is safe to assume that, if something is connected to a power outlet, it might have a magnetic field around it.

So, keep your cassettes and floppies away from all the aforementioned stuff. I know, it is so tempting to put a cassette or floppy on top of a monitor, but don't!

Also, do not place your cassette deck next to or on top of a monitor or TV. Magnetic interference may very well cause a NEVER LOAD condition! Even if the magnetic fields surrounding a monitor may not be strong enough to permanently mutilate recorded data bits, the playback head is designed to sense very small magnitudes of magnetism (the recorded tape tracks!) and can therefore easily pick up enough extraneous interference to play havoc with the LOAD function.

Power supplies should be on the floor, not on the computer desk...

In addition to the above mentioned sources of magnetic fields, there are magnetized scissors, screwdrivers, memo-stickers, paperclips (the large type) and don't forget the high-intensity lights which have a transformer hidden in their base!

8.0 CHOICE OF TAPES

In the preceding installment, I have given you my personal preference of four tape brands. My choice is the same for floppies.

This does not mean that other brands are not usable. I have been involved with magnetic media for most of my professional life as an engineering scientist and my personal choice is based on extensive exposure to the performance of these media.

Much to my dismay, I recently found the one brand that showed atrociously bad oxide coatings (Fig.14 of Part II) still on the market! That brand now also markets C10's for computer use. I'm sorry to report that they STILL don't know how to coat evenly, although the "pyjama stripes" are gone. Instead, I found irregularly shaped "islands". Phooey!

In part IV, I will discuss test tapes and touch upon head azimuth adjustment in a little more detail. Until then, may your tapes always LOAD...

WORD PROCESSING

TASWORD TWO with ZEBRA DISK DRIVE
VERSION II 9/6/85

by: Andy Gippet

This version of Tasword Two word processor gives you optimum use of your Zebra Disk Drives and full compatibility. You can save and load Tasword to and from disk. Also you can save and load text files to and from disk, with the added option to also load your old text files from cassette. The menu has been changed to allow for an added option also. You can now catalogue the disk directory with out ever stopping the program. This will also happen if you make an error when loading your text files. There is also a change in the printing format. The program now also asks you how many copies of the text file you want printed.

You must first make this auto start program so that Tasword will work with the auto START function of the disk drives.

```
10 LET a=PEEK 23611
20 POKE 23611,a+b
30 LOAD "tas"
```

SAVE this program in this manner: SAVE "start" LINE 10

Next load your copy of Tasword from cassette and go to basic. Once you have typed in everything correctly, you will be able to run the program and save your new Tasword to disk.

Delete the following lines...

```
11
790
1100
1110
```

Add the following lines...

```
15 POKE 23609,2: CLEAR 33279: GO SUB 4000: LOAD "tascode.cod"
CODE: LET a=USR 59081: GO TO 10
25 CLS: GO SUB VAL "4000"
26 PRINT AT 2,0;"catalogue Disk directory.....d"
27 PRINT AT VAL "4",VAL "0";"print text file.....p"
100 IF INKEY$="d" THEN GO TO 900
251 LET I=14: PRINT AT I, VAL "0";"Number of copies (1)";
GO SUB VAL "6000"; IF A$="" THEN LET A$="1"
252 LET K= VAL A$
279 FOR I= 1 TO K
281 NEXT I
```

LIST GROUP

NYC Personal Computer Show '85 (Ken Gordon) - Saturday & Sunday, October 19th and 10th
Madison Square Garden - Admission \$7.00.

```
700 CLS: SAVE "tas" LINE 15
710 SAVE "tascode.cod"CODE 54784,10751
780 GO TO 25
800 PRINT AT 1,VAL "0";"Saving file to Disk...."
RN
900 CLS: CAT #: PRINT: PRINT: PRINT "Press any key return..."
920 IF INKEY$="" THEN GO TO 920
930 CLS: GO TO 25
940 PAUSE 75: CLS: CAT #: PRINT: PRINT "PRESS ANY KEY TO RETURN!"
942 IF INKEY$="" THEN GO TO 942
945 CLS: GO TO 2018
1010 IF LEN a$>VAL "8" THEN CLS: PRINT AT VAL "12",VAL "0";"too many characters - max is 8"; GO TO VAL "1005"
1030 LET I=VAL "12"; GO SUB VAL "800"; SAVE a$+("."txt")CODE b,a: CLS
1044 PRINT: PRINT "Press any key..."
1046 IF INKEY$="" THEN GO TO 1046
1050 GO TO 25
2000 CLS: PRINT AT 2,0;"Is the Text File from Disk or CASSETTE?"
2010 PRINT: PRINT "Press (D) for DISK Press (C) for CASSETTE"
2012 IF INKEY$="d" OR INKEY$="D" THEN LET g=1: GO TO 2018
2013 IF INKEY$="c" OR INKEY$="C" THEN LET g=2: GO TO 2018
2014 GO TO 2012
2018 CLS: PRINT AT VAL "8",VAL "0";"type the name of the text file";AT VAL "10",VAL "0";"and press ENTER"
2020 LET J=0: LET I=16: GO SUB 5000
2022 IF g=2 THEN GO TO 2034
2024 IF a$="" THEN GO TO 2009
2028 ON ERR GO TO 940
2030 LET b=FN p(VAL "62216"); LOAD a$+("."txt")CODE (a+b),((FN p (VAL "62221")+VAL "22")$VAL "10"
2034 ON ERR RESET: PRINT "start cassette..."; let b=FN p(VAL "62216"); LOAD a$CODE (a+b),((FN p(VAL "62221")+VAL "22")$VAL "64"-a): GO TO VAL "10"
4000 PRINT AT VAL "0",VAL "3";"Tasword Two word processor": RETU
RN
```

HACKING TIPS

COOKIE	POKE 26197,0	Stops Bin monster	POKE 36004,0	Infinite lives
FREEZE BEES	POKE 34610,0	Infinite lives	POKE 36301,201	No crushers
PI-BALLED	POKE 40416,x	x = number of lives	POKE 35784,255	Lets Monty fall a great height
PYRAMID	POKE 44885,0	limitless energy	ESKIMO EDDIE	POKE 24686,24: POKE 24687,76
ARCAOIA	POKE 25776,0	Infinite lives		Infinite lives
ZIP-ZAP	POKE 53751,0: POKE 53752,0: POKE 53753,0:		KOKOTONI WILF	POKE 43742,0
	POKE 54141,0: POKE 54142,0: POKE 54143,0:		POKE 42214,x	x = Number of lives
	POKE 54144,0	Infinite energy	POKE 42177,2	This changes the colour of most of the sprites to RED, so you don't die if you touch.
WILD WEST HERO	POKE 23821,x	x = number of lives (max. 32)	LUNAR JET MAN	POKE 37569,201
				No enemy
TUTANKHAMUN	POKE 27783,0	Infinite lives	POKE 43082,x-1	x = level
DEFENDA	POKE 34163,0	Infinite smart bombs	MOON ALERT	POKE 37035,201
	POKE 35730,x	x = number of lives		No enemies in air
Mr WIMPY	POKE 33501,0	skip first stage	POKE 42854,185	Nothing kills you
	POKE 33509,x	x = number of lives (Max 32)	HORACE GOES SKATING	POKE 29270,0
	POKE 33721,x	x = number of peppers		Removes all traffic
	POKE 33693,0	Infinite lives	POKE 30762,0	Removes the Ski Slope
	POKE 43105,0	Infinite peppers	HORACE & THE SPIDERS	POKE 27680,0: POKE 24960,0
				Infinite lives
			COOKIE	Type all four POKEs for infinite lives
			POKE 28695,62: POKE 28696,5: POKE 28697,0: POKE	

List
Group

How "letters" work - A Bootstrap

We receive dozens of requests for information each month. Some are general in nature, but most ask us specific questions about hardware, software, and compatibility.

Since we don't (and can't) have all the different types of HW & SW available, your editorial staff simply can't answer all the questions raised. We try, e.g., by sending pages from back issues of LISTing or referring the questions to another source of information, but we need your help.

If you see a question in the letters section, and you know the answer, please send the answer to LISTing and/or the individual. If you send it to us, we'll publish it and pass it on.

Oh yes, we don't print numbers street addresses unless told specifically to do so.

Paul Donnelly
List Group
P O BOX 438
Centerport, N Y 11721-0438

DR & MRS JAMES P TEDONE
ENFIELD CT 06042

8/4/85

Dear Paul,

I thought it was about time that I communicate with all of you at LIST. I am quite happy with my affiliation with LIST and the newsletter each month. I am sorry that I have not attended any meetings, even though I would like to. I wanted to mention how happy I am with my SPECTRUM ROM and the programs I ordered with it. I did have a problem loading THE Hobbit because of low quality recording but I copied the tape using my DSAVE hardware. The ROM I made switchable with my TS ROM by a kludgy method of wiring two chip sockets in parallel with switch as shown in LIST article on same. It's a bit messy inside but it works.

I have recently decided to stay with my TS2055 and invest some more time and money into this machine rather than relearn a new system. I used the SPECTRUM as the basis for my decision. Because there is so much good hardware and software available in England for the SPECTRUM I have decided to go that way with my future purchases. I have been holding back resources for over a year making this choice. Three weeks ago I ordered a ZX Microdrive with adapter from EMC and I am still awaiting delivery.

I will probably get a full printer, modem, and I am presently researching which available language I want to learn (Forth, Pascal or C). I wouldn't mind an opinion or article on this in LISTing. Also would anyone know if there is MODEM with software that works on a TS with emulator. I'll keep you all informed as to how everything works out and I am anxiously awaiting my copy of the library tape.

James Tedone

P S The reason I have chosen today to write is that my new WP program from Midjup co. just came in. It makes nice looking output on this little printer. Please excuse spelling and formatting mess. I'm in a hurry and lazy.

SHOW TIME

Oct 12, 1985 - 9AM - 5PM. Union County College -
Cranford Campus (201)276-2600 X 409 - Computer EXPO '85

LIST GROUP

DANBURY, CT. 06810.

14 August, 1985.

Dear Paul,

Just a line or three to say Hi again, and to pass on some items of the "for what it's worth" variety.

First let me say thanks for the LISTing magazine; issues have been coming through with wonderful regularity. No issue has taken more than two days to reach me and that's terrific. Making the monthly meetings is, for me, something of a three-day camel ride - but reading the Meeting Notes makes me feel I was there anyway.

Next, a word of apology. LIST Library Tape 3.5 arrived while I was on vacation. I quickly copied the tape and added a short program to the blank cartridge so as to get them back into the loop again without further delay. I do hope the wait did not upset things too much. Since this is my first Library Tape I am looking forward to reviewing it. Comments later.

Congratulations! The August/September issue of ZX Computing carries two of your letters. If readers miss you under Welcome, they'll catch you in Club News. By "you" I of course mean LIST - it's good to know our membership presence is acknowledged across the Pond.

Talking of which, you may be interested to know that I plan to be in London in October. If there is anything you would like me to follow-up on, or check-out, or whatever, do let me know. I'd be pleased to help in anyway I can.

Sad to hear dear Clive has suffered a loss of control - though it is good news that Sinclair will continue to paddle it's wares now that it is solvent again. (Will we yet see the QL on this side of the Atlantic?).

This letter is getting to be quite chatty now that I am getting into the swing of it...

...which reminds me: I had a long telephone conversation with Kirkland Olson just the other week. I won't say what was said but I will say that the main topic of conversation was the status of SYNTRAP magazine. Yes - he confirmed - the November issue was the last to go press. (My copy arrived Feb 24). Yes - he does want to put the December issue together, but the trouble is you see... And so it goes. As for those of us who sent in our subscription renewal checks for 1985... you guessed it. Olson does make mention that he has some software and stuff around, and is offering those who are willing to trade their subscription check a package of more-or-less equal value. He is now looking for the time to put together the letter describing the offering... Ah well, sorry to see a good one go down.

On the lighter side, I did enjoy Steve Kaye's letter to the Editor of Computer Living / New York. Save me a real chuckle that one did. Even though I enjoy the use of several computers - from the modest ZX 81 up through the Epson 8K 10 with 16 bit co-processor - I must say I agreed with his point-for-point. (Sometimes an Editor's lot is not a happy one - what say you Paul?).

Till the next time!

Sincerely,

[Signature]
Peter Jennings.

24 E University Village
Starkville, MS 39759
August 21, 1985

Dear Sir,

Enclosed is a report of my project with the TS1055 that I had contacted you about earlier. We have just field tested it last week due to several delays. It appears to be working well.

However, a couple things mentioned in the report never materialized. First, I had great difficulty in getting the power inverter to work, and, in fact, it is still not operational. The diagram given in Radio Electronics was not correct and, later, when corrections were applied, it was still not operational. Therefore, we have used AC power generators. Also, my modem has some noise problem or perhaps something else, but it has been sent back for repairs.

Thank you for your correspondence. I have not attempted to build the LED output yet due to the problems I encountered just getting other things to work, but I hope to get to that later. I hope you enjoy the report.

Sincerely,

[Signature]
Joe Walker
Joe Walker

We sure do. Thanks for sharing your experiences with us Joe. His report appears on the next page.

LETTERS TO LIST

JEFF:

THANKS FOR SENDING THE SPECTRUM - 2068 ROM TABLE IN YOURING THE MAY/JUNE ISSUE OF THE HORIZONS. I CAME ACROSS THE ARTICLE DESCRIBING THE CONNECTION OF THE 1000 RAMPAK TO THE 2068. IN THE WAY DESCRIBED HOW TO GET IT TO BE ADDRESSABLE BY BANK SWITCHING IN BASIC. I JUST SAY I LEARNED SOMETHING HERE. FOUR OF THE MEMBERS IN OUR GROUP RECENTLY (EVENLY) GOT OUR AERODISK INTERFACE, WHICH INCLUDES 64 K OF MEMORY. UNFORTUNATELY, IT HASN'T COMPLETED GIVING US ALL THE NEEDED INFORMATION. ONE PROBLEM WE HAVE IS THAT OCCASIONALLY WE LOSE THE TIMEX DISK COMMANDS. THE ONLY WAY WE KNEW HOW TO CURE THIS WAS TO TURN OFF THE MACHINE. THIS, OF COURSE, AIN'T THE WAY IT'S SUPPOSED TO WORK. ENTER YOUR GROUP'S ARTICLE. THE LINE "OUT 244,0" RETURNS YOU TO THE "HOME BANK" WAS EXACTLY WHAT I NEEDED. I FIGURED THAT ALL I NEEDED TO DO WAS TO KEEP "OUT PUTTING" NUMBERS UNTIL A DISK COMMAND WORKED.

SURE ENOUGH, WHEN "OUT 244,1" IS ENTERED, DISK COMMANDS WORK! THAT MADE MY DAY! THANKS FOR THE ARTICLE.

THAT BRINGS ME TO THE LAST OF THIS LETTER. THIS TYPE OF THING IS WHAT I WANT TO SEE MORE OF. I WOULD LIKE TO START RECEIVING A NEWS LETTER FROM YOU (IF AVAILABLE), WHICH I CAN THEN PASS AROUND THE USEFUL INFORMATION IN IT. (LIKE ABOVE) IF THERE IS A FIRST-LEVELER, LET ME KNOW.

ONCE AGAIN, THANKS FOR THE TIMELY INFORMATION!!

THANKS

(403)
345-0535
DAN HARGENS
2104 So 35 Ave.
OMAHA, NE 68105-3122

Try cleaning the rear edge connector. A 'K' joystick schematic was published in a back issue of ILIST. It is quite simple. Take the IF apart and look inside.

We respond to all first-time inquiries. Priority goes to those who send in a self-addressed stamped envelope. Inquiries receive a sampling of back issues (up to 6 pages).

Bob King: Sounds like you have a bad interface, though it could be your keyboard. Have you tried the IF on someone else's 2068? Take a look at a keyboard Schematic and you'll see that one line, KEY controls 'J' through enter!

Sincerely,

Bob King

So far my main interest with my 2068 has been Sinclair adventure games. Subscribe to both Sinclair UK and ZX Computing. If you can help please reply. Seems that the Timex survivors in this country have trouble responding to inquiries. I hope your group is different. Thank you for your interest and cooperation.

West Covina, CA 91790
August 21, 1985

CURRY COMPUTER
5344 West Banff Lane
Glendale, AZ 85360

Best Bob.

Thank you for such prompt advice in filling my order for the ZX Microdrive, 10 wafers, and wafer box. I think the ZX Drive is ok, but I am beginning to have my doubts about the quality control of the wafers.

Here is my story as it developed. I first got the Interface 1 with 1 Microdrive and the four standard wafers (from Bob Dyl's English Microconnection). On setting up, I put in the introduction wafer and it would not load... just run and run and finally give "No file found" report. I put in the Games and it came right up with the menu and I actually played the "alien attack" game. Removing the wafer and resetting and running it again I could not access the Games Designer portion. (File not found). Putting in the Business wafer I found that both Tasword II and Masterfile worked perfectly! I then put in the blank and tried to format it and got a low number like 27 on doing a CAT 1. Trying to format again, I got a "0" bytes remaining report on CAT and if you tried to load a program it said "File full" or something similar.

Now since the Business wafer did work good, I was generally pleased with the system. I attributed the failures to the fact that my "Sinclair ROM" was the early EMU-1 and the ONMI-EMU was a faster chip and had pull up resistors. (Although these are installed in my home 2068). I sent the sample wafers that didn't work to Bob Dyl, wrote Doug Dewey, talked to Dave Clifford about Z-link and sent him the blank wafer that didn't format and ordered another ZX Drive from Bob Curry with 10 wafers.

In a short time I had 5 wafers that were back ordered from Bob Dyl plus replacements for Intro and Games wafers, the extra drive from Curry with 10 wafers, and the new ONMI-EMU. Now I thought all will be peachy keen! This was the impression as I played the new game and Intro wafers, the Intro with the new drive (which had added color but deleted the copier program), and the old Business wafer as all worked perfectly.

Now according to Dave Clifford the proof is in formatting. So I tried the new 15 blanks... about half would format to 86K or so, but the remaining ones would format and give a title on CAT but would show "0" bytes available! Now I thought, well I do have some irregular "zingers", like pull-up resistors in both the computer and the ONMI-EMU. And I do have Ray Kingsley's debugged EXROM Epro... maybe it is a "slow" chip like the early EMU's. So off to work went the Interface 1, drives, Z-link and ONMI-EMU. Since the 2068 at work is unmodified in any way, it would be just like "another customer" for all these items. At work, I got exactly the same results, even though on one of the "good" blanks, I was able to add five programs from cassette to fill 76K bytes and all worked perfectly.

The general rule seemed to be if a wafer worked it worked well in all respects. If it didn't work well on formatting it would soon die and format to "0" bytes remaining, even if it had given 27 or 12 bytes remaining on first formatting. The main noticeable characteristic of the "bad" wafers was that in the formatting process described in the manual as "screen blinks for a while, then is clear, then blinks again..." the last blinking bars do not appear! (DISK TABS WARE DOES NOT CURE WAFER)!

This still suggested some hardware problem, so in looking carefully I noticed that because I use a monitor, my cable is much closer to the Interface 1 than the TV or ear/mic jacks, so there is a slight mechanical interference in that the corner of the Interface 1 has to be over or under the cable coming straight out of the 2068. Aha! I discovered a flaw that might be twisting the edge connector just enough to say lift a contact and maybe even introduce hum to the recording head if a ground was lost! So off to the nearby Radio Shack to get right angle RCA plug and eliminate the mechanical interference. Result, zilch! No change. Now I thought if this is a hardware problem it can only be in the ribbon connector between the Interface 1 and Microdrive. (It is easy to have the piercing contacts of a ribbon connector not make contact). On the way home I bought a new 6" ribbon with 16 place edge connectors and what do you know... no change in conditions at home either!

Well, I have learned that everything works perfectly in either the modified machine or the unmodified 2068. The common things like Z-link, ONMI-EMU, Interface 1, and Drives work on either 2068 and with the ribbon replaced and the EMU-1 replaced. They are not suspect. About the only culprit left are the individual wafers... looking at one that appeared to be a used one (the blank that came with Interface 1), it has a very off center pressure pad with oxide build-up. So perhaps some of the wafers being sent from England to the American Timex-Sinclair dealers are returns or not factory fresh! If not then Sinclair has a quality control problem. (I realized that the adapted 2068 may be a hostile environment, but the wafers that work seem to always work reliably).

The good news is that double pull-up resistors don't matter, nor does the Kingsley EXROM. The only noticeable effect of replacing EMU-1 with ONMI-EMU was that it eliminated some file not found reports in one tape, in a machine with pull-up resistors. Another plus is that my American version of TASHMAN Parallel interface works with or without Interface 1 attached. (Doug Dewey and Bob Dyl say this isn't the usual case, maybe that is the debugged EXROM at work? or the other people were not using the 2068 model TASHMAN.)

Of the 15 blank wafers (some of the Bob Dyl ones were tagged with paper spots) here is the list of bad ones:

Number	Name (or paper tag if any)
1275	pink "M"
1285	blue "M"
1765, 1775, 1655, 1775, 1765	none

And the "good" ones:

Number	Name (or paper tag if any)
1275	blue "M"
1275	pink "M"
0605	pink "M"
17-5	none
1785	none
1785	none
0795	Business & 3 orange tags 539/42/533
1384	Intro (demo w/Microdrive)
2774	Intro w/copier
3034	Games & yellow 6150

* Bob Dyl replacements for tapes with Interface 1
The "serial" numbers must be date codes of production as they do duplicate.

Does anybody have any suggestions?

Bob
Howard
WAG DA I

Has anyone else had this problem? Bob, why was the "copies" program deleted? Ray's EXROM is not "in the system" in Spectrum mode.

EXCERPT

Dear Paul,

I think that joining LIST was one of the best things I've done to aid my Sinclair/Times computer hobby and already I've had a tape kit sent to me in the LIST loop. And since I do want to remain a member, I will renew now so if I forget Feb 86 I won't loose out. Enclosed is check for \$15 for dues Feb 86 to Jan 87.

I wrote Sinclair Research - got a price list of ZX81 parts, made a copy for you.

● I've got a ZX81 with a bad keyboard connector - some rows don't work.

● (Donald then goes into a long account of his problems with loading the LIST tape he received and appears to suggest that it had often insufficient signal levels; but certain portions seemed to have a very high level? - CRB).

After reading Cedric's article it does bring up a lot of questions in my mind. For one thing could it be that the recorded material is varying from the edge of the tape? Like the tape wanders on the recording head so that not all the recorded path goes by the portion of the tape head that reads the tape?

I repeat, joining LIST is one of the best things I've done to further my ZX81-TS1000 computerese.

Donald S. Lambert
3310 Clover Drive S.W.
Cedar Rapids, Iowa 52404

● Don, Is there a pattern in the rows or columns that don't work on your ZX81? This could give you a clue as to whether one of the 8 diodes D1 - D8 is defective or maybe one of the 10k resistors in resistor-pack RP3. Maybe Paul can send you a copy of the ZX schematic to help you out.

● The copy of library tape 3.5 that I got in my loop, gave me no problems but I had a bad tape in the past too, so anything is possible.

● Tape wander is a very rare occurrence; tape movement alignment pins, immediately downstream of the tape head assure a steady tape path. If it DOES occur though, the effect is indeed similar to azimuth error.

Cedric Bastiaans

EXCERPT

Dear Paul,

Thank you for bringing your CONSTANTLY EXCELLENT newsletter to a printing reproduction standard of HIGHEST QUALITY.

PLEASE include me in future (hardware group) meetings.

Enclosed T/S 1500 Alphacom 32 PRINTOUTS may be cut and or pasted as you choose - if you can use any part of it.

Again I must commend you for your IDEAS on LIBRARY TAPES, Newsletter contents, HARDWARE "DO IT YOURSELVES" etc. The individuals that I have met at meetings have been more than SERENDIPITOUS (sic) for me.

● P.S. Where can I find an ELIZA program?

● Martin, I have made inquiries about Eliza-like Spectrum programs in England. Will advise you. Meanwhile, is there anyone out there in 2068-land who can help?

Cedric Bastiaans

Loren: Back issues are \$1.25 to members. Practically all back through 11/84 deal with Spectrum and/or microdrive in some way.

Aug 18, 85

Dear Mr. Donnelly, I have just read 2 letters which were printed in the August ZX Computing over your name.

In one of these letters you refer to a tinister to create a Spectrum fuss. Can you please tell me where I can purchase one? Also your letters each mention a different amount for membership/subscriptions. Can you tell me which is correct? I will send a check by return mail. (I enclose a SASE).

I also have a great deal of English software for the Spectrum and so far the only program that I have not been able to run is "Volfella". I understand that this is due to interrupts. However, I have Mega-Basic (from your Spectrum) and this was interrupted and yet loads and runs perfectly permitting the use of TRACE, SPRINTS (and spins generator), PLAY and SOUND provide sound and animation simultaneously. PAN and SCROLL will permit simultaneous scrolling in 4 different directions (inward/outward) I am sure that some of the other 55 odd commands also include the use of interrupts.

I will be in England for 2 weeks in September and while in London expect to visit Taylor's book store and W.H. Smith to pick up a few books and cassettes. By the way have you seen the magnificent 1/48 magazine on cassette? Hoping to hear from you soon.

Real Elias

6805 Drenfield Ave.
Farma Heights, Ohio 44130

REAL - You need the pullup resistors on D0,D1,D3-D7.
Try Clifford Associates for the Z-Link Board.

Stockton, CA 95209
26 August 1985

Paul Donnelly
Sec'y Treas.
LIST
Box 438
Centerport, NY 11721

Dear Paul:

Saw your letter in ZX Computing. As a 2068 tinkerer I'd like to receive your newsletter.

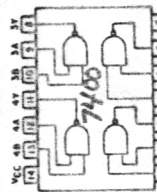
Enclosed is \$15 for a year's subscription and a check of getting a list of back issues?

I'm interested in Spectrum emulation/use of microdrives, etc.

Thank you.

Sincerely,

Loren Latker



Ed Burton from Merced, CA called wanted to know which pins of the 7400 (Shown in our bank-switched memory article in T-S Horizons and LIST) to use. Actually, Nazir used a 7404, hex inverting buffer. Pin 1 is input, pin 2 for inverted output. A 7400 can be used, but the input must go to pins 1&2, the output from pin 3. It just depends on what you have in your "junk box". Anybody care to guess which 7400 series chip can do the inverting and replace the two diodes?

L.I.S.T.

Dear Mr Elder,
I have been buying ZX Computing for only a year now and am quite pleased with your inclusion of Timex 2068 and hardware articles, of late.

Your U.S. readers should know that Spectrum emulation is practical in a number of ways, listed on the attached reprint from our newsletter. The least expensive method, by far, of achieving emulation, is that described by Paul McGinnis in your Feb/Mar issue. There are a few additional points which I can add to Mr. McGinnis' fine description. These are:

- 1) The cost of a Barclay check is \$4.00. In figuring total cost, a U.S. buyer should include what he pays for the service.
- 2) VAT should not be paid. (However, on a recent split order to PV tubes, I paid £4 less for an order with straight postage and VAT than I did for one sent without VAT, but with a £7 handling charge).
- 3) The Modem port is a matter of contention, but 7C, 7D, 7E and 7F or C7, CF and D7, DF seem to be places to start. (NO Hardware!)
- 4) The 2068 joystick ports are at F5 and F6. The sound synthesizer at FE. TRY; OUT 254,7; OUT 254,23 for sound. SEND a 14 to F5 to activate the joyport. Then try reading F6.
- 5) Spectrum peripherals, by and large, will not work with the 2068 Buss, and can in fact destroy either the computer or peripheral or both. A "Twistor" is required to convert the 2068 buss to a Spectrum Buss. These are theoretically simple to make, but require tedious and precise assembly. Some peripherals do work, primarily because they use a partial, ZX81 compatible, bus. Two that I know of (and have) are the DK'Tronics light pen and Kempston joystick interfaces. Mains power is not a problem — only the net DC voltages are important.

I hope these comments are of help. More specific information can be gleaned from the LIST newsletter.

Our user group prints a fairly large (22-24, photo-reduced pages) monthly newsletter, which in recent months, has described the twistor, emulators, a complete ROM cross reference (2068 to Spectrum) and how to use microdrives with the 2068. Membership in our group is \$15/year and includes 12 issues of the newsletter. We also circulate a tape of member generated programs.

One last note, (which I hesitate to add, as I have not actually seen the product) is that there is a rumour of a "Clone" program which will translate Spectrum software into the proper 2068 ROM calls. How this is done, without extra memory, is difficult for us to fathom, but we will try to obtain the product, for review.

Very truly yours,
Paul Donnelly
Sec'y Treas.
LIST
Box 438
Centreport, N.Y.
USA.

CLUB NEWS

CORRECTIONS:

That is 245 not 254 for the Joy and Sound ports

Also, you must specify which joystick by placing a 1 (for left) or 2 (right) in the 'B' register as well as 246 (F6) in the 'C' register. Extended I/O addressing takes care of this so that:

```
10 OUT 245,14
20 LET JOY_POS = IN 502: PRINT JOYPOS,
30 GOTO 10
Will retrieve the Joystick data (502=256 + 246)
```

The above letter was written in April of '85 (was Clone a hoax?), the "Club" letter in December '84. How the \$9.95 figure got there, I have no idea. Even then, dues were \$12 (they're \$15 now).

For Sound try:

```
10 For 1 = 7 to 13
20 OUT 245 1; OUT 246 INT (RND#255)
30 NEXT 1
40 GOTO 10
```

As for the 2050 Modem (which I still don't have), see Miles Rose's article. He says that 73(H) and 77(H) respond. I suggest that A₇ is not decoded and by adding 128(D) or 80 H to these numbers I get F3 and F7 (or 243 & 247) which seems to make sense.

L.I.S.T. Group

Dear ZX Computing

The LIST GROUP has been formed to help keep the spirit of the Sinclair-Timex "people's" computer alive. At this point, we're getting organized; officers have been elected and a monthly newsletter started. A Charter is yet to be written, but "meetings" are held once per month, usually in members' homes.

Despite the lack of a written charter the general goals of our group include:

- 1) Exchange of information, ideas and knowledge on and about TS computers.
- 2) Hardware and Software demonstrating and perhaps even exchange.
- 3) Community service to increase computer literacy.
- 4) Perhaps some advantage to members through the exercise of a group buying power.

Right now we have about ¹⁰⁰ members and a modest budget. A circulating tape library has begun, and we have generated a pretty substantial newsletter. Membership/subscription fees are \$^{9/85}15 a year.

Hope to hear from you soon.

Paul Donnelly
Long Island Sinclair Timex
Group
P.O. Box 438
Centreport, N.Y. 11721-438
U.S.A.

The purpose of the data acquisition system is to take in analog data from instrumentation, convert the data to a digitized form, store the data, and transfer the data to other computers for analysis. Benefits of the system include the saving of time and money, as compared to previous means of data acquisition and handling, as well as diversity in application. To achieve these goals, a system was developed that was built around a Timex-Sinclair 1500 computer.

First, an analog to digital converter board was used to convert the analog electrical stimulus to a digital form that could be interpreted by the computer. Inputs to the board are received in the form of voltages from 0 to 2.55 volts through an eight channel input bus. The eight channels allow data to be collected almost simultaneously from several inputs so that one input might be better correlated to the others. Outputs are received by the computer in the form of a number between 0 and 255.

The computer then may either record the input number as is or convert the number to the corresponding physical measurement before recording it in memory. The computer serves as a means of data reception and manipulation, data storage, and overall system control. Since it is programmable in BASIC, it is easier for personnel to operate the system versus programming an alternative control unit such as a microprocessor. Being programmable, it is more diversified in function than some systems that are specific to their task. The power outlet, recorder, and printer are all directed by the computer.

The power outlet is a controlled power source by which the recorder and printer are controlled. Since the computer was not equipped with a function to shut the recorder and printer off and on, the controlled outlets were necessary. By this means the recorder and printer may be turned on or off as needed. Thus, the outlet serves as a control unit and as a means of conserving power when the system is in the field being powered by a DC power source.

The DC power source is regulated to provide power to the computer, recorder and controlled outlet in the form of a DC supply. However, the printer requires an AC supply. Therefore, the 12V DC is converted to 117V AC by a power inverter. The power inverter supplies the controlled outlet for the printer. When using a DC source, only the printer is supplied with AC power, the recorder and computer being directly powered by the DC source.

The printer serves as a monitor of the internal actions of the system, as needed, and as a means of recording data in addition to the recorder. This means of monitoring provides a hard copy of information and has less space and weight requirements than a television. The recorder provides the primary means of data storage and serves as a backup copy to data transferred to other computers.

The data transfer is accomplished by means of a telephone modem. The modem allow data and programs to be transferred from the computer to almost any other computer system. Therefore, the computer has at its disposal any computer facilities available to the systems with which it is able to communicate. It also features a RS232C communication device that can be used with some modification of the modem hardware. Further, the modem provides additional possibilities for using the system in remote locations with less hardware. By telephone communication, data could be instantly transferred and monitored by other computer facilities eliminating the need for an in field AC power inverter, cassette recorder, printer, controlled outlet, and a large computer memory.

Operation of the system consists of first connecting the power supply. For a 12V DC supply, connect the source to the power inverter. Then, the controlled outlet is connected to the power inverter. Switch the power switch of the power inverter on. The power switch of the controlled outlet is then switched to the DC option. Cables from the recorder and computer DC power outlets are then connected to the controlled outlet box as labeled. The printer transformer is plugged into the labeled 117V outlet and connected to the printer power outlet.

In the case of a 115V power supply, these procedures are followed. The controlled outlet is connected to the 115V source. The power switch is flipped to the AC option. The recorder, computer, and printer are connected to the controlled outlet as labeled. The computer is not turned on or off by a switch, but is powered as soon as the plug from the power source is inserted in the power jack.

Next, it is necessary to load the program from cassette to computer. First type POKE 36867,255. This statement turns all the outlets on. Then press play on the recorder and type LOAD "program name". Then press ENTER. Allow sufficient time for the program to load as predetermined in lab. Then press RUN. Program begins to execute and may ask for inputs as indicated by the printer. The program should contain statements to automatically save the programs and data.

After the run, reverse the operating procedures concerning power supply and disconnect analog input lines. The system may then be taken to the lab for data transfer to other computers by modem. The information is transferred as outlined by the user manual for the modem.

Overall, the system offers several advantages to previous means of data collection. First, it provides accurate digitization of analog inputs versus prior time consuming methods of manual digitization. The data can be viewed and manipulated at once or more quickly analyzed than previously available. Also, the system is versatile in function. The system can be used in the field or in the lab due to its power inverter. The power inverter may also be used without the other system components. In addition, the controlled outlet can be used to control other devices as well. This system should be well suited for a variety of applications.

Bibliography

- Durang, Charles F. Timex Sinclair 1500 Personal Home Computer User Manual.
- Stephens, Jim. Powerful Projects With Your Timex/Sinclair. Glenview, Illinois: Scott, Foresman, and Company, 1985.
- Sweeney, Dave. "Uninterruptible Power Supply." Radio-Electronics, March, 1985, pp. 43-45.

- JOE WALKER

```
10 REM POWER-ROOT
20 LET C=1
30 INPUT "INPUT ARGUMENT ";a
40 LET h=a
50 INPUT "POWER OR ROOT? ";b$
60 IF b$="P" THEN LET b$="POWE
70 INPUT "VALUE OF POWER OR R
ot";d
80 LET g=d
90 LET e=ABS d
100 LET f=INT e
110 IF a<0 AND b$="r" AND (f/2)
=INT (f/2) THEN PRINT "ILLEGAL A
RGUMENT"; STOP
120 IF b$="r" THEN LET d=1/d
130 IF b$="r" THEN LET b$="root
140 IF h<0 AND (f/2)<>INT (f/2
) THEN LET c=-1
150 LET a=ABS a
160 PRINT g;" "; b$;h;" = ";a;d
*
```

Stanley W. Livingston

SCUBA DIVE POKE 55711,x x = number of lives
POKE 45686,0 Stop player 2's clones opening as
frequently as normal.

AM DIDDYUS POKE 24942,x x = no. of lives Max 250

Need a 2040 Power Supply?

Jameco Electronics Catalog #AC 2400 @ \$3.95 looks suspiciously familiar. Eddie offers its part #A-AC224-UL-1K2A at \$8.95. This is marked as a "Timex Computer printer" supply (24 volts AC at 1.2 AMPS).

Jameco's DC 901 at \$4.95 might be a good replacement for your TS 1000/or Spectrum supply.

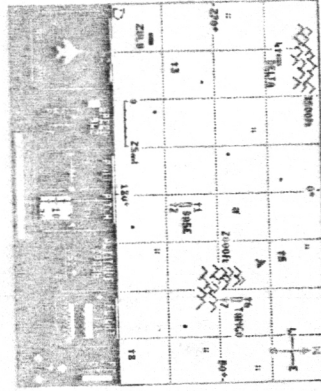
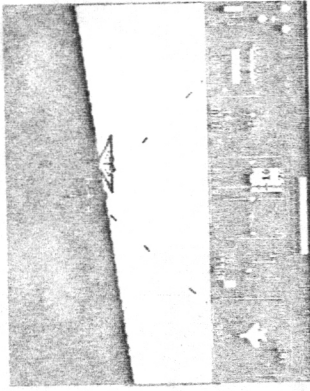
A public service message

LITERATURE

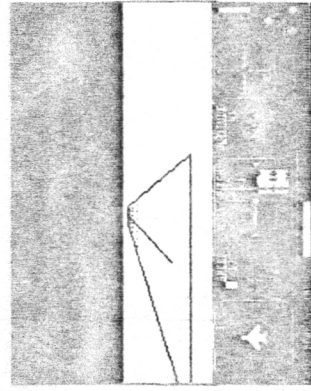
A GOOD BOOK FOR TYRO-HACKERS

The Plain English - Repair and Maintenance Guide for Home Computing - Henry F. Beechold

TIMEX' "FLIGHT SIMULATOR" IS OK.
"FIGHTER PILOT" FOR THE TS-2068
(I PURCHASED MINE FROM KNIGHTED
COMPUTERS, FULTON, NY) IS GREAT.



LIST



LLOYD PAINTER

QUAKERTOWN, PA

CODEBUSTERS

Let's get this out in the open. "There is no foolproof way to protect cassette-based TS 2068/Spectrum Software". That sounds like a strong statement; it is. Because of the cassette loading method used, any TS cassette can be "broken" either during, or immediately after, the initial load. Further, there are hardware methods (Winky Board, Radio Shack attenuator, Interface III) which either copy the tape without even using the computer or take complete control of your program from the "outside".

For those of you who would like to, at least, make life difficult or annoying for those trying to hack at your software, however, there are some simple protection methods available. This series of articles will look at a number of these common methods.

WHAT'S IN A PROGRAM

In order to get into your computer, the information stored on the tape must pass through the tape LOADING system of the T/S machine. This system consists of the EAR jack, conditioning network and SCLD on the hardware side and the LOAD subroutine in the ROM. While it is possible to LOAD BASIC as CODE (e.g. LOAD""CODE), even then, the system must run at least one BASIC statement in order to begin. Since the program must pass through BASIC once, there is really no way to prevent it from being broken into in some way.

For CODE type programs and very heavily protected BASIC programs (more on techniques later), the hacker can, of course, always read the header, generate a false one of his own (e.g., one which has the same # of bytes, but no autostart) and then LOAD the program, either as BASIC or CODE. Thus the system is not secure.

While there are any number of unique protection schemes, it may serve, at this point, to look at a typical commercial program LOAD.

What, specifically, happens after you Type LOAD?" and press PLAY?

Usually, a short BASIC LOADER goes into your 2068/Spectrum first. This is typically very short program and looks like this (in it's unprotected state);

```
10 PRINT AT 10,10;"STILL LOADING":LOAD  
""SCREEN$:LOAD"":LOAD""CODE:RAND OMIZE USR START
```

This would have been saved with an autostart command. (E.G. Save "XXZ" line 10)

Let's dissect this simple, one line program and see what it does.

- 1) PRINT AT... Simply tells the user to hold his horses, everything is going fine.
- 2) LOAD""SCREEN\$ - Gives you something to look at while the main program is LOADING.
- 3) LOAD"" - This LOADS any real BASIC portion of the actual program. For many MC game programs, this step is not used.
- 4) LOAD""CODE - LOADS the MC part of the software. The address to which the code will load was determined when it was saved.

LIST

- 5) RAND... Is the jump out of BASIC and into the MC program.
START is the address at which the MC starts (not necessarily the address at which it LOADS).

Variations on this theme include LOADING the whole thing (SCREEN, BASIC & MC) as one code LOAD, having the second BASIC program autostart and LOAD the rest, and the use of hyperloaders. Hyperloaders simply set up their own tape LOADING program instead of the one in ROM. They're generally faster, less reliable and harder to duplicate (higher frequencies).

In the sections that follow, we'll look at ways to protect your LOADER program and main program. Subsequent articles in this series will deal with the more advanced techniques.

PROTECTION METHOD #1 - Ø REM

This is a classic, left over from the (almost) bygone days of ZX81 code. The Ø REM can protect your copyright message by making it difficult to remove. You can always make the first line of your program a line Ø by POKEing the line number with Ø. To do so, find the beginning of your program by PEEKing the system variable PROG. The reprint from the August LISTing, given below, provides the technique. Remember that the program start can move around, depending on how your system is configured. In a "bare" Spectrum its 23755, "bare" 2068 starts at 26710, and with microdrive, the Spectrum changes to _____.

To get rid of a line Ø, simply reverse the procedure and POKE PROG +1,1.

```
10 PRINT "HELLO";
20 GOTO 10
```

NEXT ENTRY:

```
100 LET PROG = PEEK 23635 + 256 * PEEK 23636
110 PRINT "PROGRAM STARTS AT "; PROG
120 PRINT " AND HERE'S WHAT'S THERE!"
130 FOR I = PROG TO PROG + 20
140 PRINT I; PEEK I
150 NEXT I
END GOTO 100
```

Now look at page 122 in your Spectrum manual or page 255 in the 2068 manual. What you're looking at is the actual BASIC program. The first two numbers are the line Ø. They should be Ø (for the number of 256's) and 10 (for the Ø of 1's). To get a line Ø

POKE (PROG + 1), Ø

Now GOTO 100 again, or just LIST your program.

METHOD #2 - The Invisible Program

You can make your program "unlistable" in a couple of different ways. The simplest is to make paper and ink the same color, during LOADING. If the program is broken at that point, all the hackers will see is a blank screen. E.g., If you're loading, first a BASIC and then a Code section, your Loader program might look like this:

```
10 LOAD"" : PAPER 7, INK 7 : LOAD"" CODE
```

This would make your whole program "unlistable". Until, of course, the hacker figures out that he or she should enter INK Ø.

Errata :

We received a note from James G. DuPuy of the Cleveland User Group. Jim states that he is the author of that In-Between program which we ascribed to Emmet J. in the August issue. Our mistake was in LOADING and PLAYING the program without reading what Emmet was telling us. He had apparently enhanced the original program, particularly with regard to the use of a Parrot compatible voice synthesizer. The program was not originally meant for inclusion in the Library. James has been kind enough to authorize us to use his part of the program on tape #4 (due in October or November 85) anyway though.

Thanks Jim and keep up the good work with RAMTOP.

LIST Group

You can make whole lines, or statements within lines disappear (but still function) by changing the INK, PAPER characteristics of the display file for that line.

Try This:

```
10 REM REM PRINT "HELLO"
10 GOTO 10
30 STOP
40 POKE 26714,17
50 POKE 26715,63
LIST
RUN
LIST
```

(That's PROG + 4)
(PROG + 5)

What you've done is change the program display by poking in the code for Paper 7, INK 7. That, of course, won't show up on your screen. (Except during a scroll. The attributes don't quite keep up with the screen print routine during a scroll. That is why you can get a peek at some of the code, sometimes).

To use this technique, of course, you must find and dissect each BASIC line. Check your manual for the description of how BASIC lines are formatted. (Two bytes for line #, two for length, etc.), and use PEEKs of the system variables PROG, NXTLIN, E PPR, etc., to keep track of where you are.

The two REM's were placed in the program to leave space for attribute control bytes. The first byte, 17, sets up the Paper color. The second, 63, is the code for white on white. You can also make room for these by using the extended color key entry method. E.g., press cap. shift and/or Symbol shift and a color key to set up on ink and paper control. See pages 86 & 81 of the Spectrum manual for details.

There is one more way of changing the colours by using control characters - rather like the control characters for AT and TAB in Chapter 15.

CHR\$ 16 corresponds to INK
CHR\$ 17 corresponds to PAPER
CHR\$ 18 corresponds to FLASH
CHR\$ 19 corresponds to BRIGHT
CHR\$ 20 corresponds to INVERSE
CHR\$ 21 corresponds to OVER

These are each followed by one character that shows a colour by its code: so (for instance)

PRINT CHR\$ 16+CHR\$ 9; ...

has the same effect as

PRINT INK 9; ...

On the whole, you would not bother to use these control characters because you might just as well use the colour items. However, one very useful thing you can do with them is put them in programs: this results in different parts being listed in different colours, to set them apart from each other or even just to look pretty. You must put them in after the line number, or they will just get lost.

To get these into the program, you have to enter them from the keyboard, mostly using extended mode with the digits.

The digits 0 to 7 set the corresponding colour - ink if CAPS SHIFT is also pressed, paper if it is not. More precisely, if you are in E mode and you press a digit (let us say 6 for yellow), at any rate it has to be between 0 and 7 - not 8 or 9) then two characters are inserted: first CHR\$ 17 for PAPER, and CHR\$ 6 meaning 'set it to yellow'. If you had been pressing CAPS SHIFT when you pressed the digit, you would have got CHR\$ 16 meaning 'set ink colour' instead of CHR\$ 17.

Since there are two characters you can get some odd effects when you rub them out - you must press DELETE twice, and after the first time you will often get a question mark or even odder things appearing. Do not worry, just press DELETE again.

␣ and ␣ can also behave strangely while the cursor is moving past the control characters.

Still in extended mode,

8 gives CHR\$ 18 and CHR\$ 0 for normal brightness
9 gives CHR\$ 19 and CHR\$ 1 for extra brightness
CAPS SHIFT with 8 gives CHR\$ 18 and CHR\$ 0 for no flashing
CAPS SHIFT with 9 gives CHR\$ 19 and CHR\$ 1 for flashing

There are a couple more in ordinary (L) mode

CAPS SHIFT with 3 gives CHR\$ 20 and CHR\$ 0 for normal characters

CAPS SHIFT with 4 gives CHR\$ 20 and CHR\$ 1 for inverse characters

To summarize, here is a complete description of the top row on the keyboard.

By the way, our program is still there and will RUN. Try it. Try LIST 20.

Compare the two listings given on the next page. The only difference, in Line 10, is the replacement of REMs with control codes.

```
20:80 TO 99
40 FOR I=26710 TO 26790
50 PRINT I,PEEK I
60 NEXT I
99 STOP
100 LET PROG=PEEK 23635+255*PEE
K 23636
110 PRINT PROG
400 POKE PROG+4,17: POKE PROG+5
,63
499 STOP
500 POKE PROG+4,234: POKE PROG+
5,234
599 STOP
900 POKE 26730,57: POKE 26731,5
7
```

MODE	SHIFT	SYMBOL	DEF FN	FN	LINE	OPEN #	CLOSE #	MOVE	ERASE	POINT	CAT	POINTER
E	CAPS	Ink blue	Ink red	Ink magenta	Ink green	Ink cyan	Ink yellow	Ink white	Flash off	Flash on	Ink blue	
	NONE	Paper blue	Paper red	Paper magenta	Paper green	Paper cyan	Paper yellow	Paper white	Normal brightness	Extra bright	Extra blue	
G	EITHER										EXIT GRAPHICS	DELETE
	NONE										EXIT GRAPHICS	DELETE
K, L or C	CAPS	EDIT	CAPS LOCK	TRUE VIDEO	INVERSE VIDEO					GRAPHICS MODE		DELETE
	SYMBOL	!	@	#	\$	%	&	'	()	_	
	NONE	1	2	3	4	5	6	7	8	9	0	

LIST Group

METHOD #4 CORRUPTION

Numbers in a BASIC statement are held in two ways, the first part is the "human" or text representation used for display purposes only. The second part is that special 5 byte floating point representation. It is this second part which is actually used by the computer. You can corrupt the display part, without changing the real number by POKEing a different value into the "text" part of a BASIC line. Here's an example.

```

10 REM PRINT "hello"
20 GO TO 10
40 FOR i=26710 TO 26790
50 PRINT i,PEEK i
60 NEXT i
99 STOP
100 LET prog=PEEK 23635+255:PEE
K 23636
110 PRINT prog
999 STOP
990 POKE 26730,57: POKE 26731,5
7

```

```

26710 10 0
26711 10 0
26712 10 0
26713 10 0
26714 10 0
26715 10 0
26716 10 0
26717 10 0
26718 10 0
26719 10 0
26720 10 0
26721 10 0
26722 10 0
26723 10 0
26724 10 0
26725 10 0
26726 10 0
26727 10 0
26728 10 0
26729 10 0
26730 10 0
26731 10 0
26732 10 0
26733 10 0
26734 10 0
26735 10 0
26736 10 0
26737 10 0
26738 10 0
26739 10 0
26740 10 0
26741 10 0
26742 10 0
26743 10 0
26744 10 0
26745 10 0
26746 10 0
26747 10 0
26748 10 0
26749 10 0
26750 10 0
26751 10 0
26752 10 0
26753 10 0
26754 10 0
26755 10 0
26756 10 0
26757 10 0
26758 10 0
26759 10 0
26760 10 0
26761 10 0
26762 10 0
26763 10 0
26764 10 0
26765 10 0
26766 10 0
26767 10 0
26768 10 0
26769 10 0
26770 10 0
26771 10 0
26772 10 0
26773 10 0
26774 10 0
26775 10 0
26776 10 0
26777 10 0
26778 10 0
26779 10 0
26780 10 0
26781 10 0
26782 10 0
26783 10 0
26784 10 0
26785 10 0
26786 10 0
26787 10 0
26788 10 0
26789 10 0
26790 10 0

```

```

26710 10 0
26711 10 0
26712 10 0
26713 10 0
26714 10 0
26715 10 0
26716 10 0
26717 10 0
26718 10 0
26719 10 0
26720 10 0
26721 10 0
26722 10 0
26723 10 0
26724 10 0
26725 10 0
26726 10 0
26727 10 0
26728 10 0
26729 10 0
26730 10 0
26731 10 0
26732 10 0
26733 10 0
26734 10 0
26735 10 0
26736 10 0
26737 10 0
26738 10 0
26739 10 0
26740 10 0
26741 10 0
26742 10 0
26743 10 0
26744 10 0
26745 10 0
26746 10 0
26747 10 0
26748 10 0
26749 10 0
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26753 10 0
26754 10 0
26755 10 0
26756 10 0
26757 10 0
26758 10 0
26759 10 0
26760 10 0
26761 10 0
26762 10 0
26763 10 0
26764 10 0
26765 10 0
26766 10 0
26767 10 0
26768 10 0
26769 10 0
26770 10 0
26771 10 0
26772 10 0
26773 10 0
26774 10 0
26775 10 0
26776 10 0
26777 10 0
26778 10 0
26779 10 0
26780 10 0
26781 10 0
26782 10 0
26783 10 0
26784 10 0
26785 10 0
26786 10 0
26787 10 0
26788 10 0
26789 10 0
26790 10 0

```

Enter and run the program and you'll see the actual representation of line 10 and 20 as your 2068 sees it.

Now let's change the apparent addresses; but not the real ones.

GOTO 900 and then LIST 10. Note how, even though it appears (on the screen) that we've changed the line # to jump to (99), we really haven't. To prove this RUN the program. It works just as before (i.e. it GOTO 10 not 99).

What we've done here is poke the two text bytes for the number 10 with new values. The old ones were located at 26730 and 26731 (that's PROG + 20, PROG+21 for those of you not using a plain 2068) and were 49, and 48, the ASCII codes for l & j. We changed those to 57, the code for 9. However, we didn't change the 5 byte code, which still says 10 and controls the computers actions.†

One very important point here, and the one that causes hackers the most grief: If you bring a line which has been corrupted in this manner down into the editing section, it will be automatically "corrected" to use the false number. Try LIST 20 and then enter EDIT mode. Hit enter, LIST20,RVN. The program now really goes to 99. To the casual observer, this was what was originally intended. But, of course, the program is now corrupted and the original "true" value lost.

```

20 GO TO 99
40 FOR i=26710 TO 26790
50 PRINT i,PEEK i
60 NEXT i
99 STOP
100 LET prog=PEEK 23635+255:PEE
K 23636
110 PRINT prog
490 POKE prog+4,17: POKE prog+5
63
499 STOP
500 POKE prog+4,234: POKE prog+
5,234
599 STOP
990 POKE 26730,57: POKE 26731,5
7

```

```

26710 10 0
26711 10 0
26712 10 0
26713 10 0
26714 10 0
26715 10 0
26716 10 0
26717 10 0
26718 10 0
26719 10 0
26720 10 0
26721 10 0
26722 10 0
26723 10 0
26724 10 0
26725 10 0
26726 10 0
26727 10 0
26728 10 0
26729 10 0
26730 10 0
26731 10 0
26732 10 0
26733 10 0
26734 10 0
26735 10 0
26736 10 0
26737 10 0
26738 10 0
26739 10 0
26740 10 0
26741 10 0
26742 10 0
26743 10 0
26744 10 0
26745 10 0
26746 10 0
26747 10 0
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26752 10 0
26753 10 0
26754 10 0
26755 10 0
26756 10 0
26757 10 0
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26777 10 0
26778 10 0
26779 10 0
26780 10 0
26781 10 0
26782 10 0
26783 10 0
26784 10 0
26785 10 0
26786 10 0
26787 10 0
26788 10 0
26789 10 0
26790 10 0

```

† Note that this is a special representation which only works on integers below 65000.

*** These three lines are a very powerful routine, you can use these to PEEK any part of memory and see what is there.

METHOD #5 - BEATING THE SYSTEM

Certain system variables can be manipulated to give odd effects, or crashes.

ERRSP (23613) is the address of error returns on the machine -stack. POKE this with a 0 and you'll get a crash.

CHARS (23603) The address of the character set could be used as a password code. Poking this with anything but the proper address in ROM will corrupt the display.

PROC (23635) is the beginning of the program; move it up and you can "destroy" key lines.

STOP (23660) top line in automatic listings (use to "hide" line 10).

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ATAC ATAC POKE 36916,0 Infinite lives

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POKE 41068,17; POKE 41068,32; POKE 41100,1;

POKE 41101,0 Endless men

POKE 26142,62; POKE 26143,255; POKE 26144,0

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FRANK N STEIN POKE 28277,x x = number of lives

SABRE WOLF POKE 44786,0 Indestructible Sabreman

POKE 35702,30 Kills materialising monsters

POKE 44805,166; POKE 44876,255; POKE 44877,80

Stay permanently Cyan.

MOON ALERT POKE 42245,24 Stops time decreasing

POKE 42404,x x = number of lives

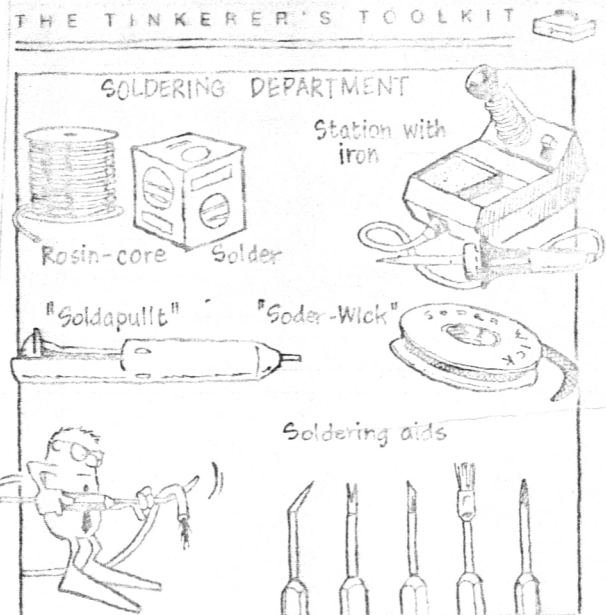
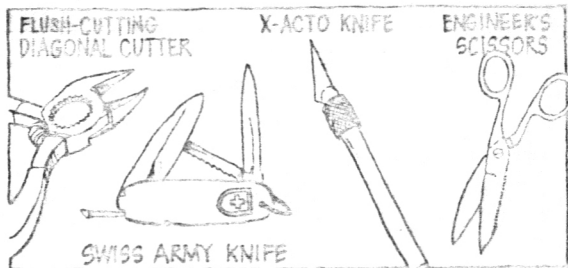
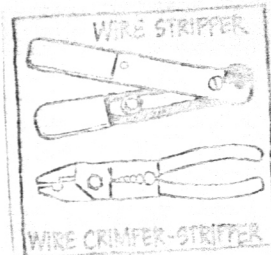
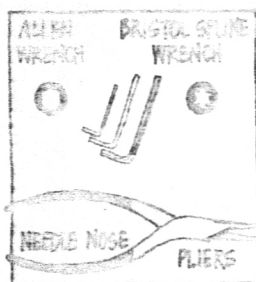
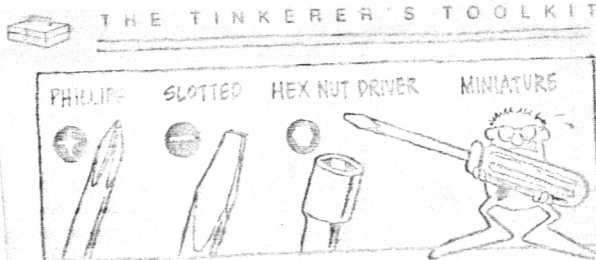
POKE 39754,0 Endless lives

ATAC ATAC 36919,x x = number of lives

POKE 36363,0; POKE 36382,0; POKE 36371,0;

POKE 36092,0 Stops the energy draining

POKE 37228,175; POKE 37260,175 Make doors open more frequently.



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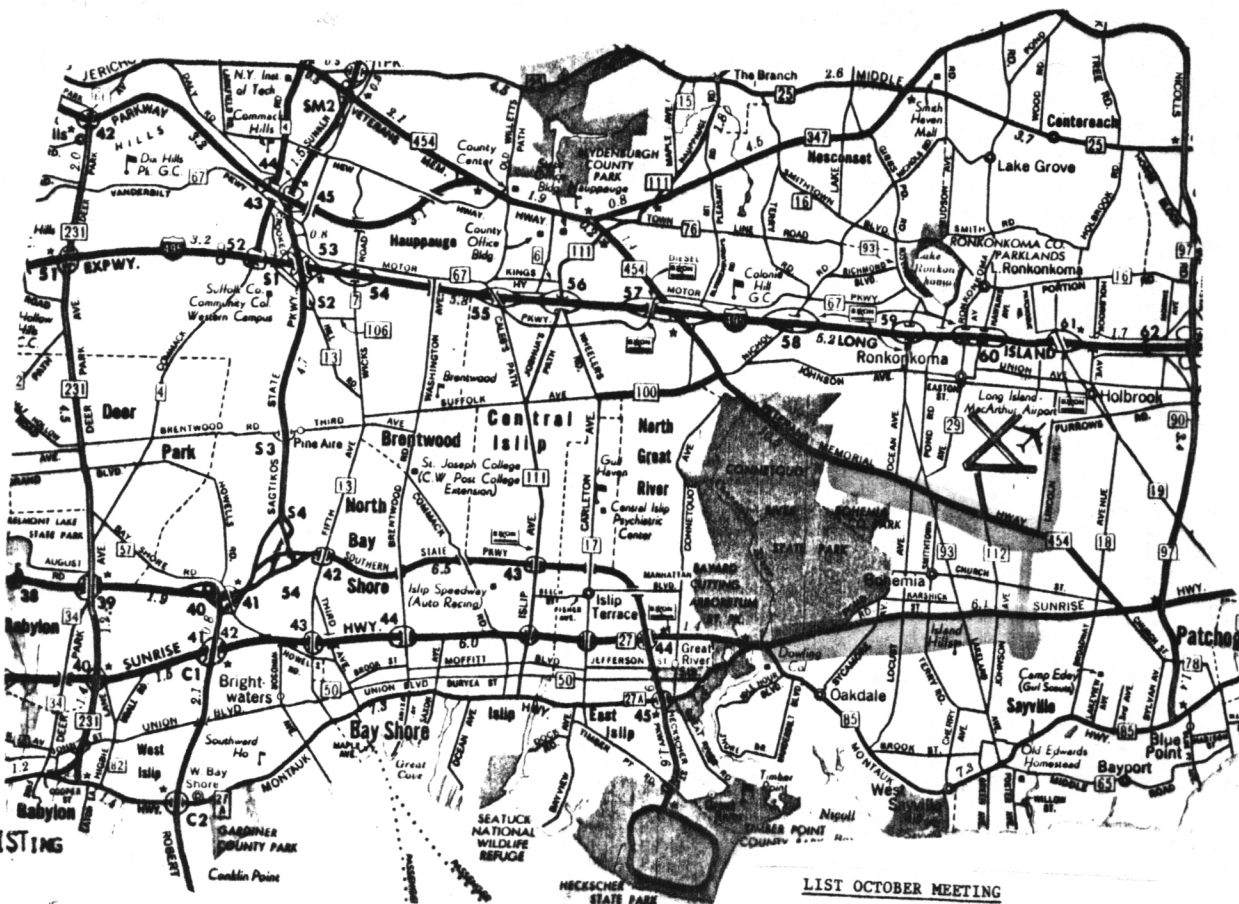
Don
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Lambert
Jan-87
52404

10:



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LIST OCTOBER MEETING

TIME: Sunday October 6, 1985 -2:PM